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Tashiro et al.

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(54) **SCORING RULE APPLICATION TARGET SPECIFICATION METHOD, CORRECT/INCORRECT DETERMINATION RULE SETTING METHOD, APPLICATION TARGET SPECIFYING DEVICE, CORRECT/INCORRECT DETERMINATION RULE SETTING DEVICE, AND COMPUTER-READABLE RECORDING MEDIUM**

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(Continued)

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CPC ***G09B 7/00*** (2013.01); ***G06K 9/6201*** (2013.01); ***G09B 7/02*** (2013.01); ***G09B 7/06*** (2013.01)

(58) **Field of Classification Search**
CPC G09B 7/00; G06K 9/6201
See application file for complete search history.

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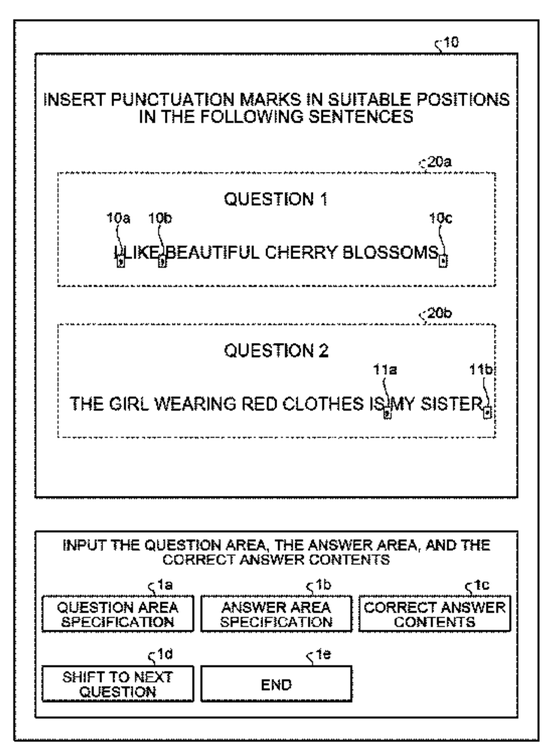
(57) **ABSTRACT**

A non-transitory computer-readable recording medium stores a scoring rule application target specification program that causes a computer to execute a process including: receiving specification of one or more areas in an image; and storing the one or more areas in a storage in a manner associated with a question number in order of being received.

9 Claims, 15 Drawing Sheets



(51) **Int. Cl.**
G09B 7/06 (2006.01)
G06K 9/62 (2006.01)

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FIG.1

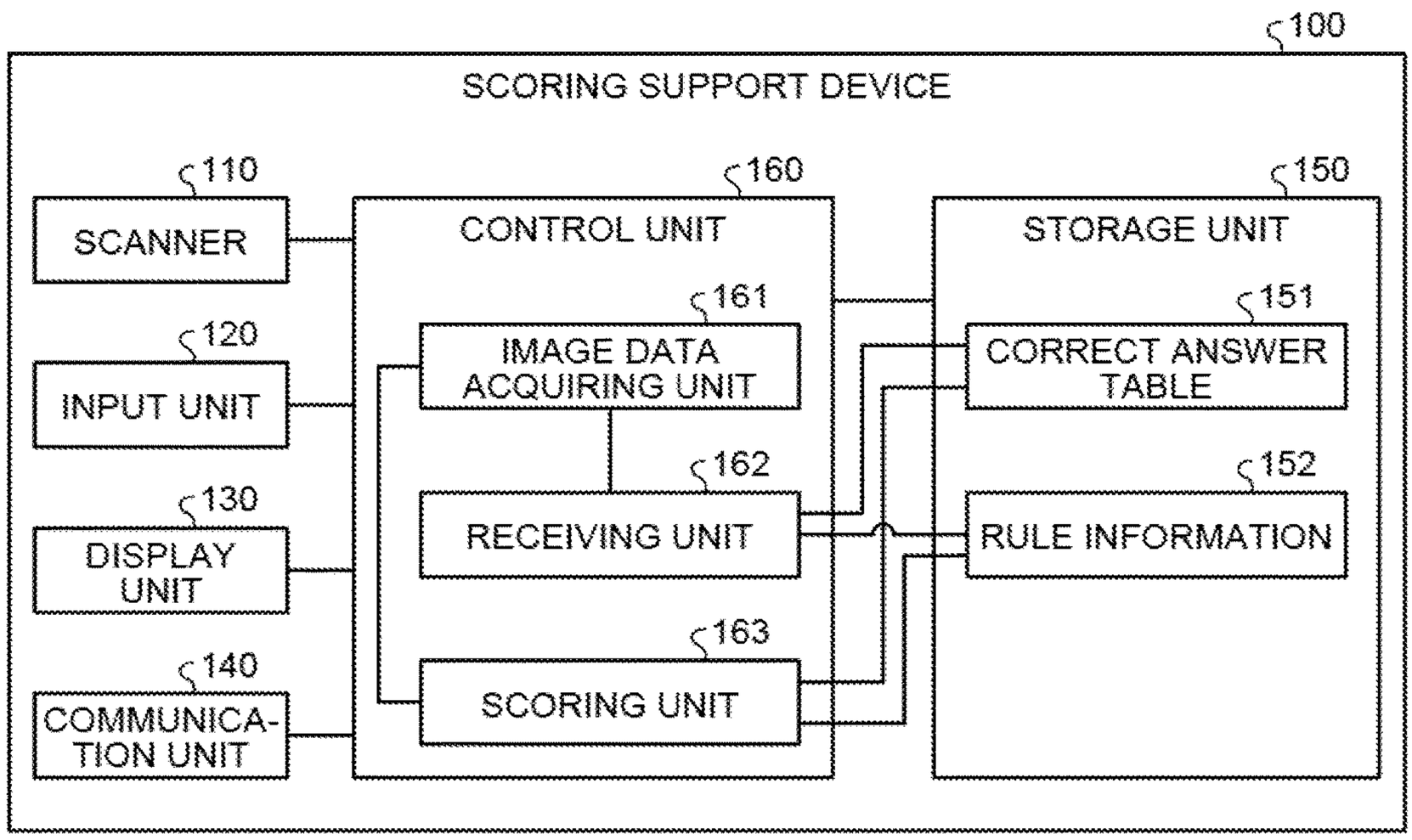


FIG.2

151

QUESTION NUMBER	QUESTION AREA	ANSWER AREA	CORRECT ANSWER CONTENTS
T101	(x1, y1), (x2, y2)	(x3, y3), (x4, y4)	COMMA
		(x5, y5), (x6, y6)	COMMA
		(x7, y7), (x8, y8)	PERIOD
T102	(x7, y7), (x8, y8)	(x9, y9), (x10, y10)	COMMA
		(x11, y11), (x12, y12)	PERIOD
...			

FIG.3

10

INSERT PUNCTUATION MARKS IN SUITABLE POSITIONS IN THE FOLLOWING SENTENCES

QUESTION 1

I LIKE BEAUTIFUL CHERRY BLOSSOMS

QUESTION 2

THE GIRL WEARING RED CLOTHES IS MY SISTER

FIG.4

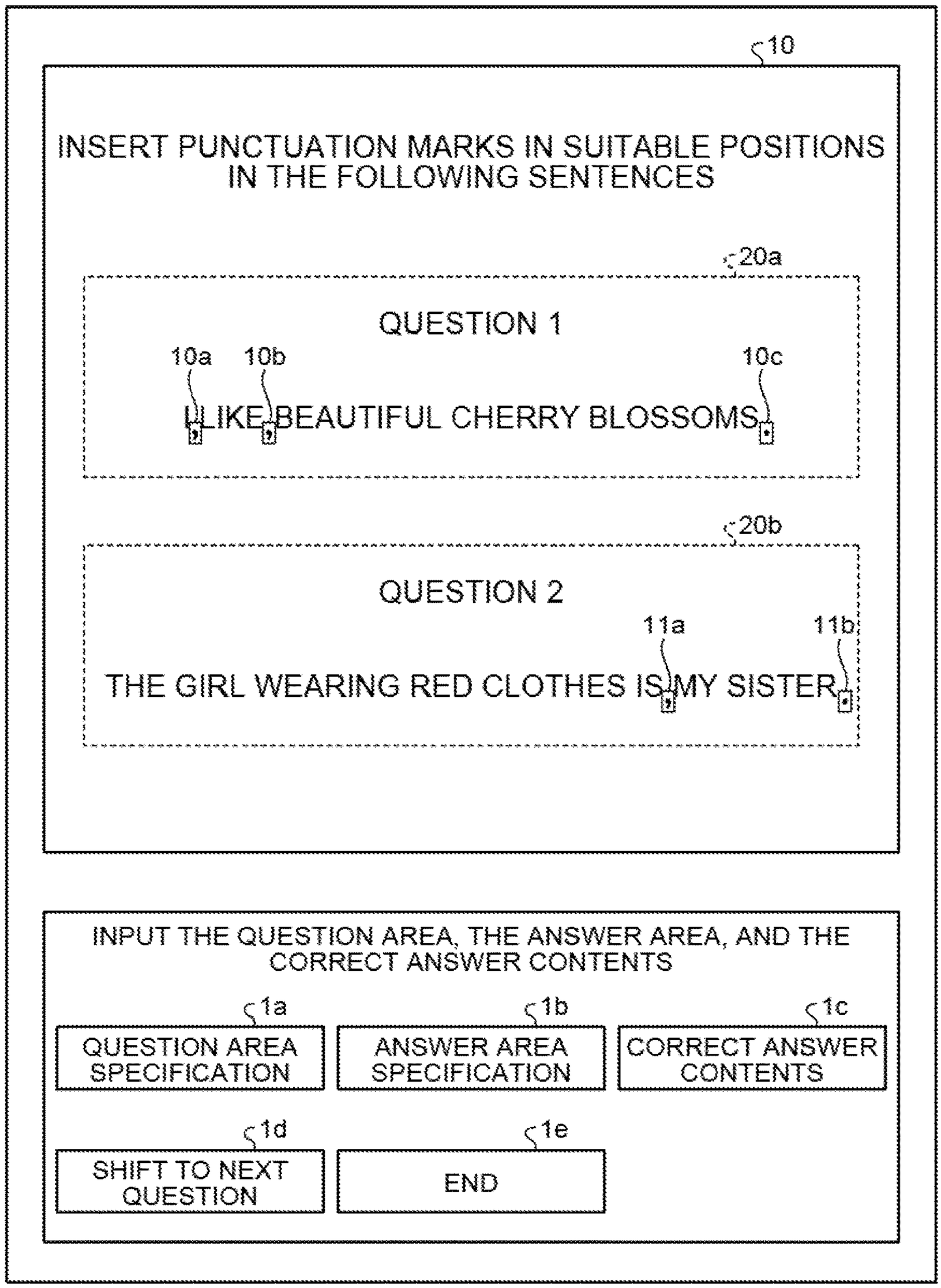

10
INSERT PUNCTUATION MARKS IN SUITABLE POSITIONS IN THE FOLLOWING SENTENCES
20a
QUESTION 1
10a
10b
10c
I LIKE BEAUTIFUL CHERRY BLOSSOMS
20b
QUESTION 2
11a
11b
THE GIRL WEARING RED CLOTHES IS MY SISTER
INPUT THE QUESTION AREA, THE ANSWER AREA, AND THE CORRECT ANSWER CONTENTS
1a
QUESTION AREA SPECIFICATION
1b
ANSWER AREA SPECIFICATION
1c
CORRECT ANSWER CONTENTS
1d
SHIFT TO NEXT QUESTION
1e
END

FIG.5

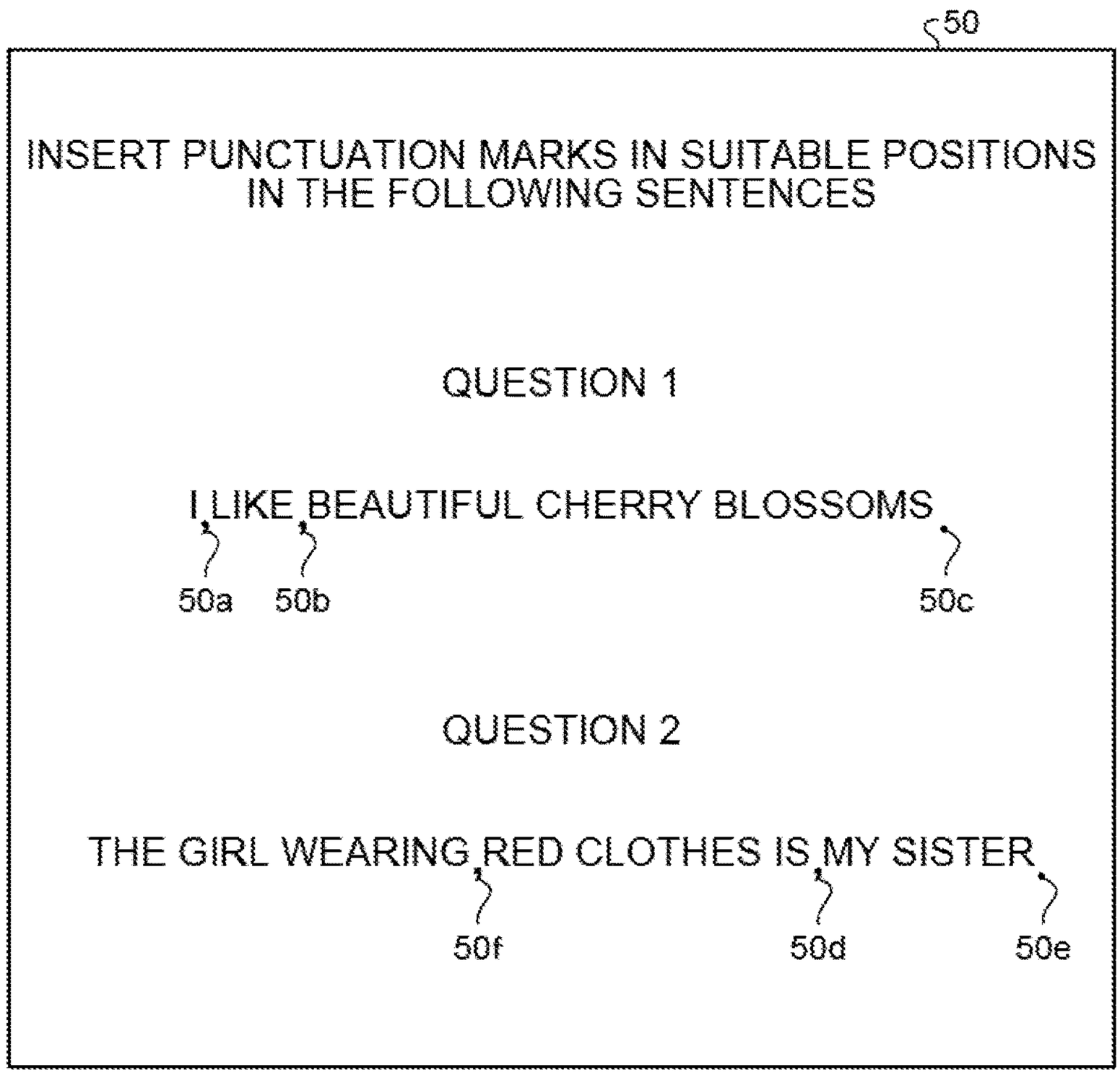

50
INSERT PUNCTUATION MARKS IN SUITABLE POSITIONS IN THE FOLLOWING SENTENCES
QUESTION 1
I LIKE BEAUTIFUL CHERRY BLOSSOMS
50a
50b
50c
QUESTION 2
THE GIRL WEARING RED CLOTHES IS MY SISTER
50f
50d
50e

FIG.6

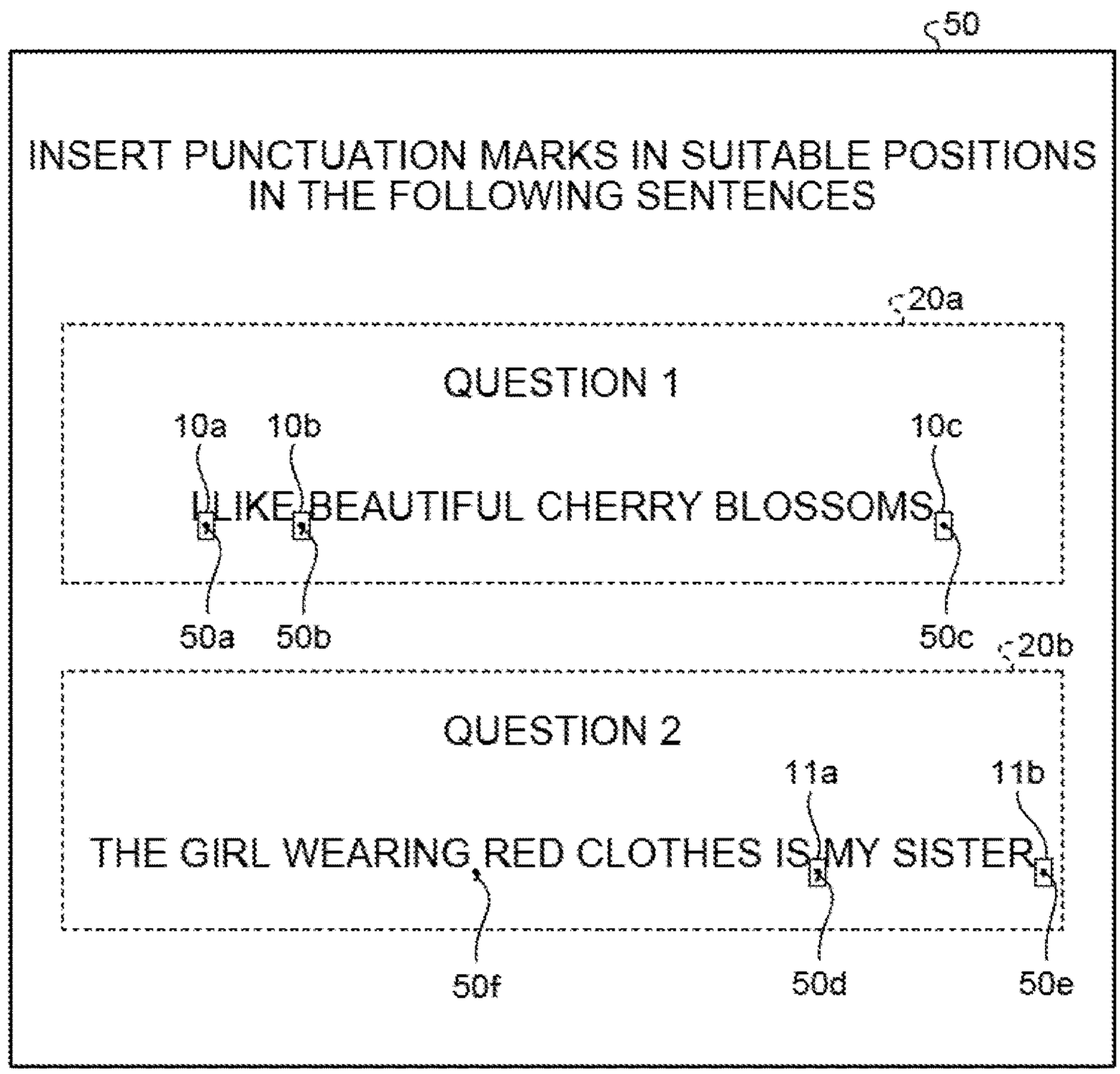

50
INSERT PUNCTUATION MARKS IN SUITABLE POSITIONS
IN THE FOLLOWING SENTENCES
20a
QUESTION 1
10a
10b
10c
I LIKE BEAUTIFUL CHERRY BLOSSOMS
50a
50b
50c
20b
QUESTION 2
11a
11b
THE GIRL WEARING RED CLOTHES IS MY SISTER
50f
50d
50e

FIG.7

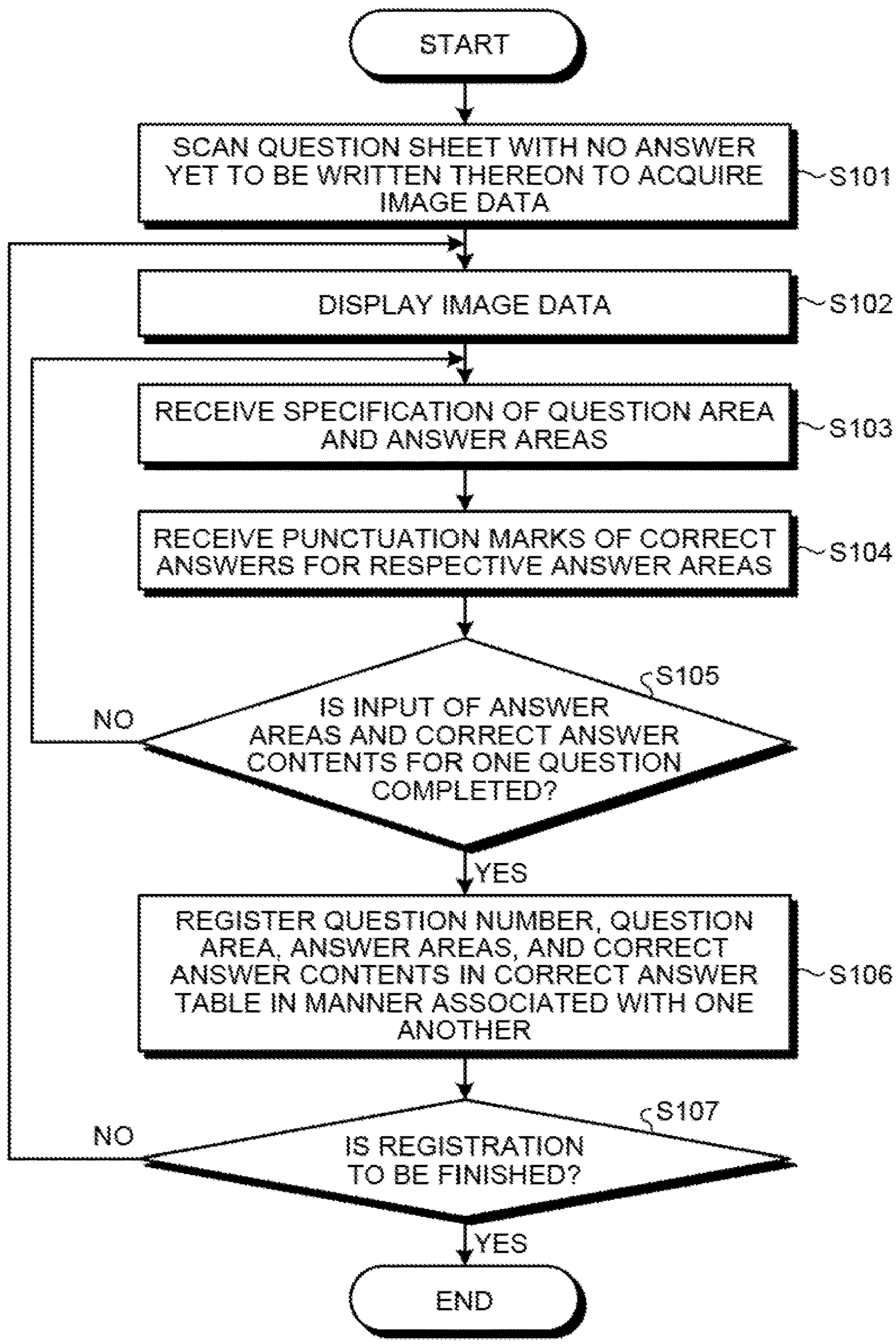

START
SCAN QUESTION SHEET WITH NO ANSWER YET TO BE WRITTEN THEREON TO ACQUIRE IMAGE DATA
S101
DISPLAY IMAGE DATA
S102
RECEIVE SPECIFICATION OF QUESTION AREA AND ANSWER AREAS
S103
RECEIVE PUNCTUATION MARKS OF CORRECT ANSWERS FOR RESPECTIVE ANSWER AREAS
S104
S105
IS INPUT OF ANSWER AREAS AND CORRECT ANSWER CONTENTS FOR ONE QUESTION COMPLETED?
NO
YES
REGISTER QUESTION NUMBER, QUESTION AREA, ANSWER AREAS, AND CORRECT ANSWER CONTENTS IN CORRECT ANSWER TABLE IN MANNER ASSOCIATED WITH ONE ANOTHER
S106
S107
IS REGISTRATION TO BE FINISHED?
NO
YES
END

FIG.8

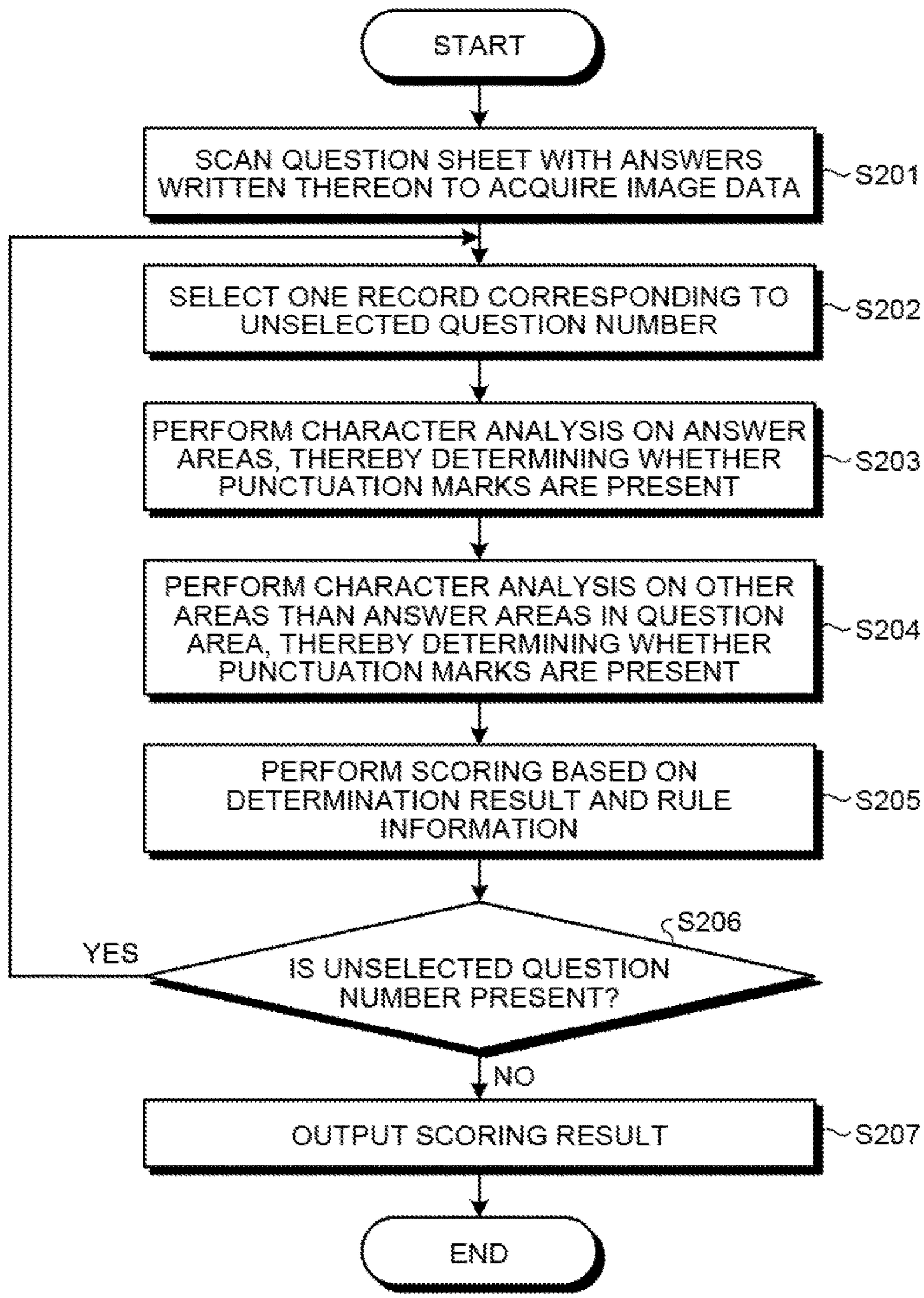

START
SCAN QUESTION SHEET WITH ANSWERS WRITTEN THEREON TO ACQUIRE IMAGE DATA
S201
SELECT ONE RECORD CORRESPONDING TO UNSELECTED QUESTION NUMBER
S202
PERFORM CHARACTER ANALYSIS ON ANSWER AREAS, THEREBY DETERMINING WHETHER PUNCTUATION MARKS ARE PRESENT
S203
PERFORM CHARACTER ANALYSIS ON OTHER AREAS THAN ANSWER AREAS IN QUESTION AREA, THEREBY DETERMINING WHETHER PUNCTUATION MARKS ARE PRESENT
S204
PERFORM SCORING BASED ON DETERMINATION RESULT AND RULE INFORMATION
S205
S206
IS UNSELECTED QUESTION NUMBER PRESENT?
YES
NO
OUTPUT SCORING RESULT
S207
END

FIG.9

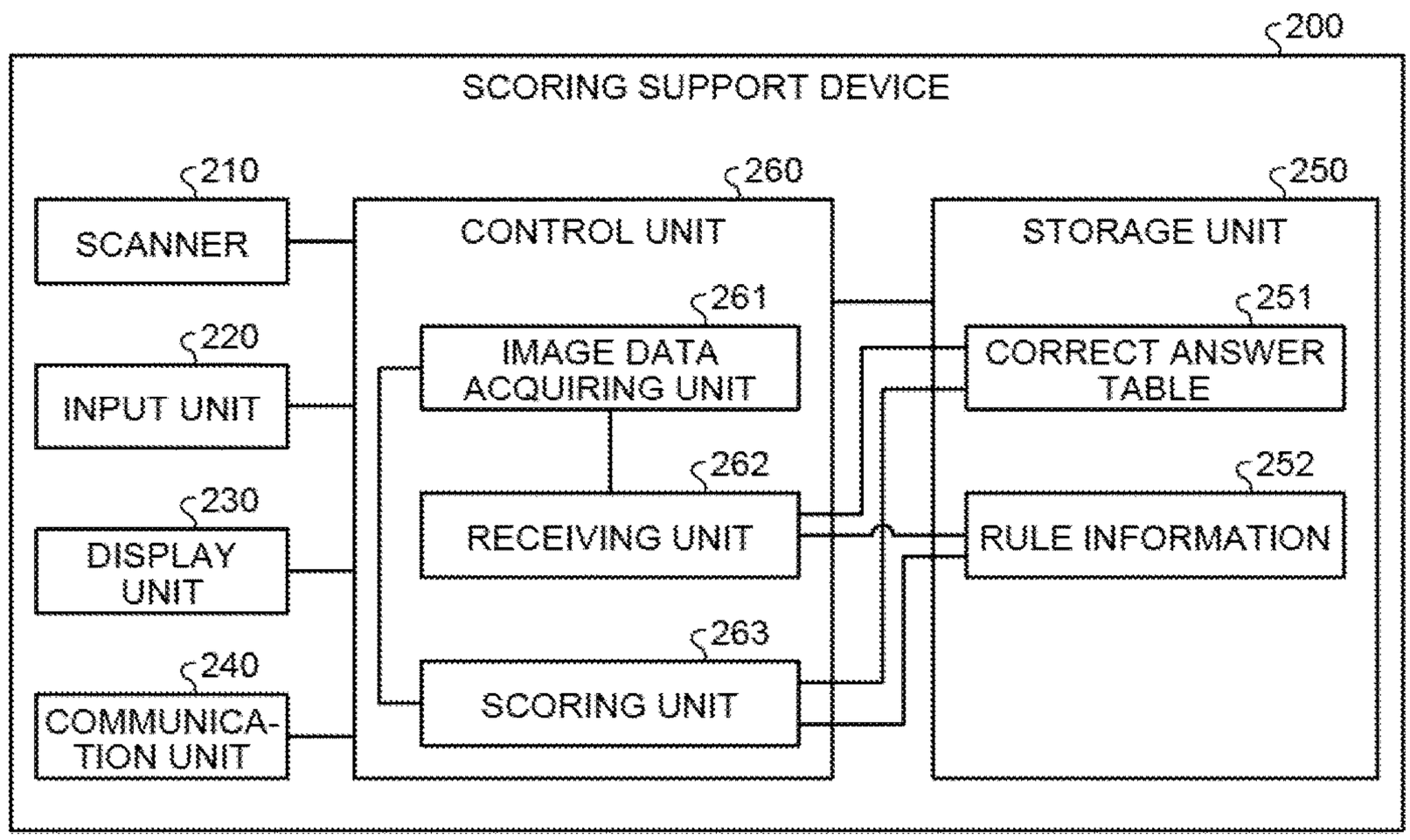


FIG.10

251

QUESTION NUMBER	QUESTION AREA	CORRECT ANSWER AREA
T201	(x21, y21), (x22, y22)	(x23, y23), (x24, y24)
T202	(x25, y25), (x26, y26)	(x27, y27), (x28, y28)
...		

FIG.11

60

SELECT CORRECT ANSWERS FOR THE FOLLOWING QUESTIONS

QUESTION 1

WHICH IS THE CORRECT WEATHER CONDITIONS FOR AN "ICE DAY"

1. A DAY WHEN THE MINIMUM TEMPERATURE DROPS BELOW 0 DEGREES CELSIUS
2. A DAY WHEN THE MINIMUM TEMPERATURE DROPS BELOW -3 DEGREES CELSIUS
3. A DAY WHEN THE MAXIMUM TEMPERATURE DROPS BELOW 0 DEGREES CELSIUS

QUESTION 2

WHAT IS THE OFFICIAL NAME OF "USB" USED FOR PERSONAL COMPUTERS?

1. UNIT SERIAL BUS
2. UNIT SEATTLE BUS
3. UNION SINGLE BUS
4. UNIVERSAL SERIAL BUS

FIG.12

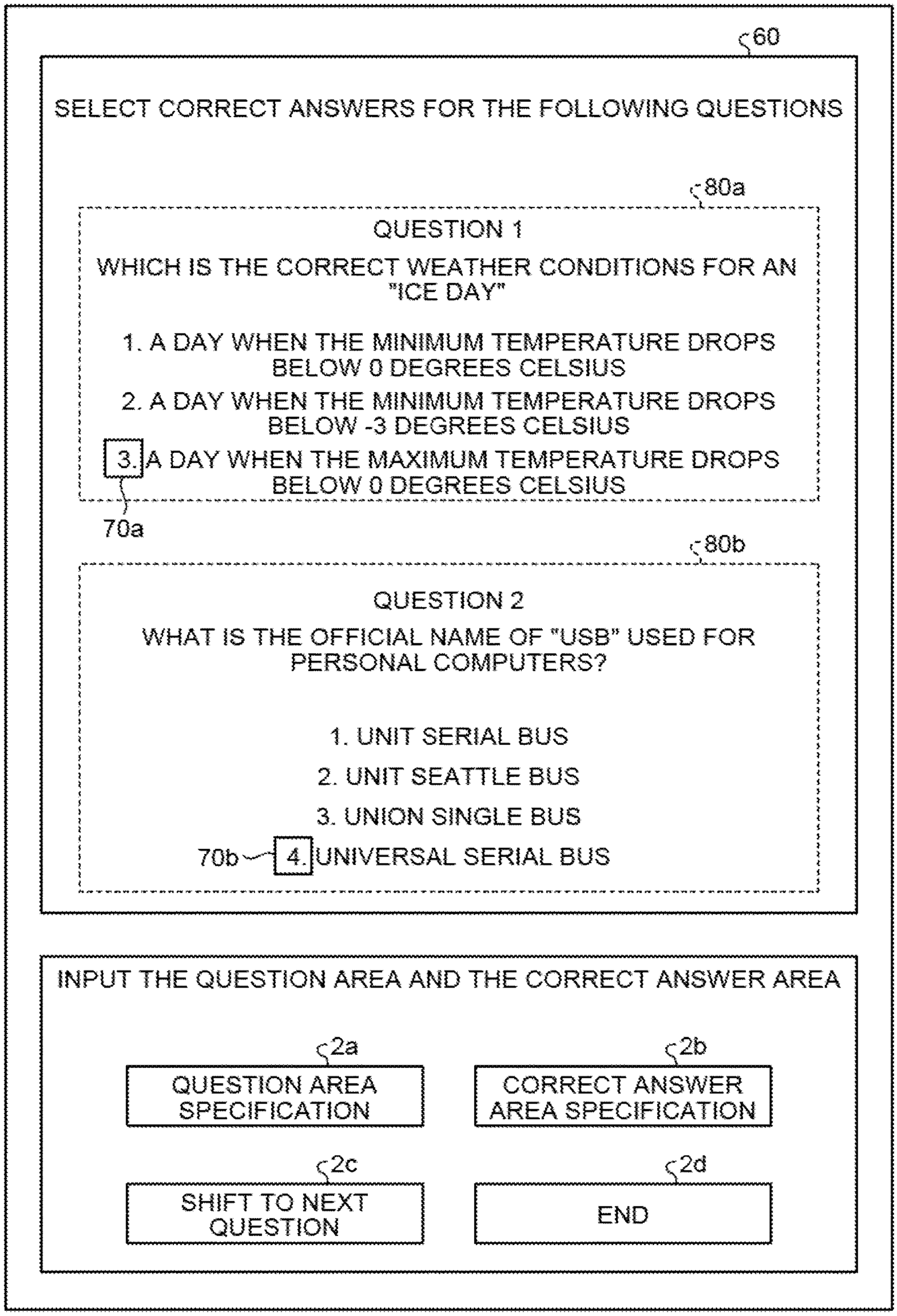

60
SELECT CORRECT ANSWERS FOR THE FOLLOWING QUESTIONS
80a
QUESTION 1
WHICH IS THE CORRECT WEATHER CONDITIONS FOR AN "ICE DAY"
1. A DAY WHEN THE MINIMUM TEMPERATURE DROPS BELOW 0 DEGREES CELSIUS
2. A DAY WHEN THE MINIMUM TEMPERATURE DROPS BELOW -3 DEGREES CELSIUS
3. A DAY WHEN THE MAXIMUM TEMPERATURE DROPS BELOW 0 DEGREES CELSIUS
70a
80b
QUESTION 2
WHAT IS THE OFFICIAL NAME OF "USB" USED FOR PERSONAL COMPUTERS?
1. UNIT SERIAL BUS
2. UNIT SEATTLE BUS
3. UNION SINGLE BUS
70b
4. UNIVERSAL SERIAL BUS
INPUT THE QUESTION AREA AND THE CORRECT ANSWER AREA
2a
QUESTION AREA SPECIFICATION
2b
CORRECT ANSWER AREA SPECIFICATION
2c
SHIFT TO NEXT QUESTION
2d
END

FIG.13

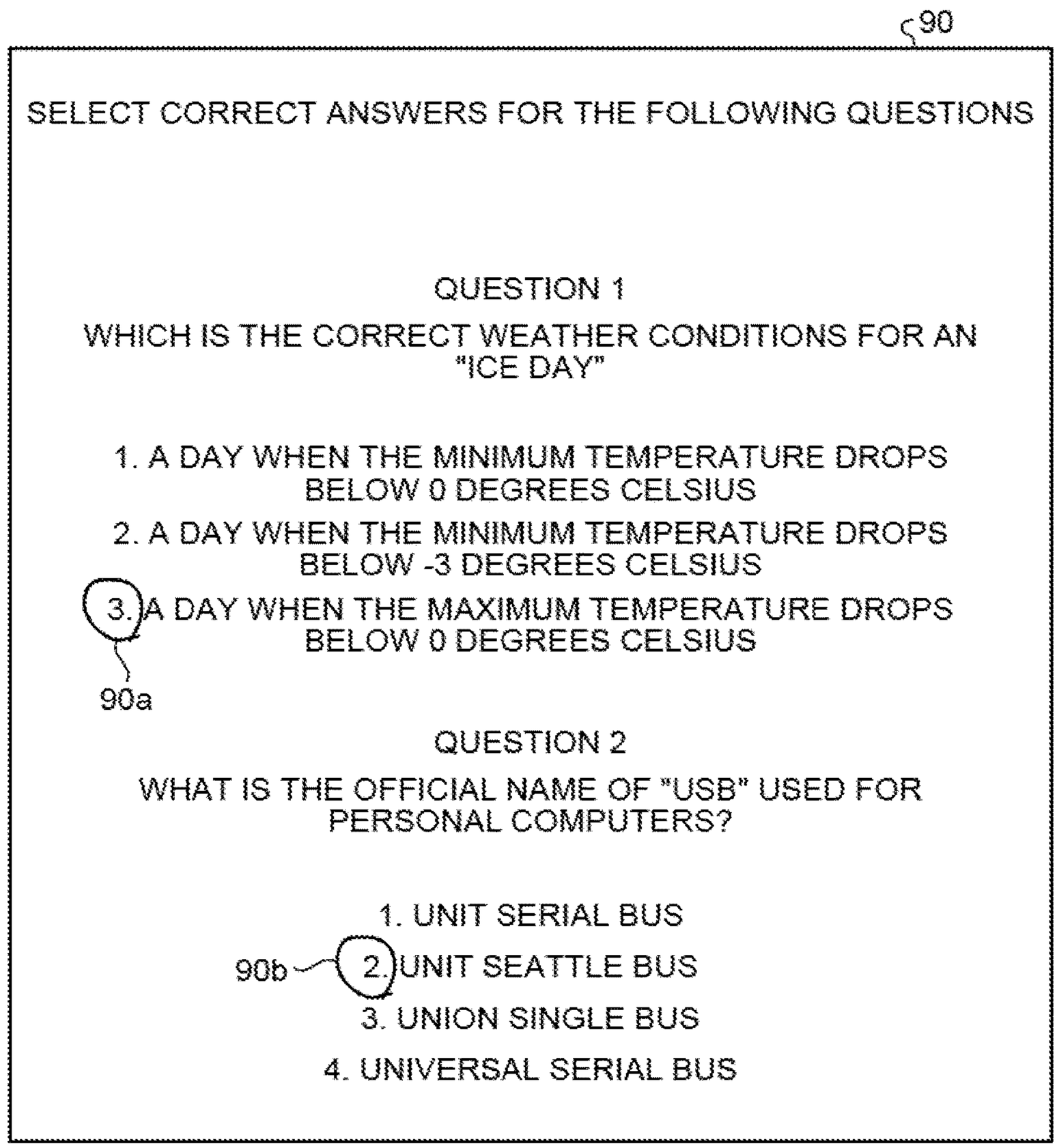

90
SELECT CORRECT ANSWERS FOR THE FOLLOWING QUESTIONS
QUESTION 1
WHICH IS THE CORRECT WEATHER CONDITIONS FOR AN "ICE DAY"
1. A DAY WHEN THE MINIMUM TEMPERATURE DROPS BELOW 0 DEGREES CELSIUS
2. A DAY WHEN THE MINIMUM TEMPERATURE DROPS BELOW -3 DEGREES CELSIUS
3. A DAY WHEN THE MAXIMUM TEMPERATURE DROPS BELOW 0 DEGREES CELSIUS
90a
QUESTION 2
WHAT IS THE OFFICIAL NAME OF "USB" USED FOR PERSONAL COMPUTERS?
1. UNIT SERIAL BUS
90b
2. UNIT SEATTLE BUS
3. UNION SINGLE BUS
4. UNIVERSAL SERIAL BUS

FIG.14

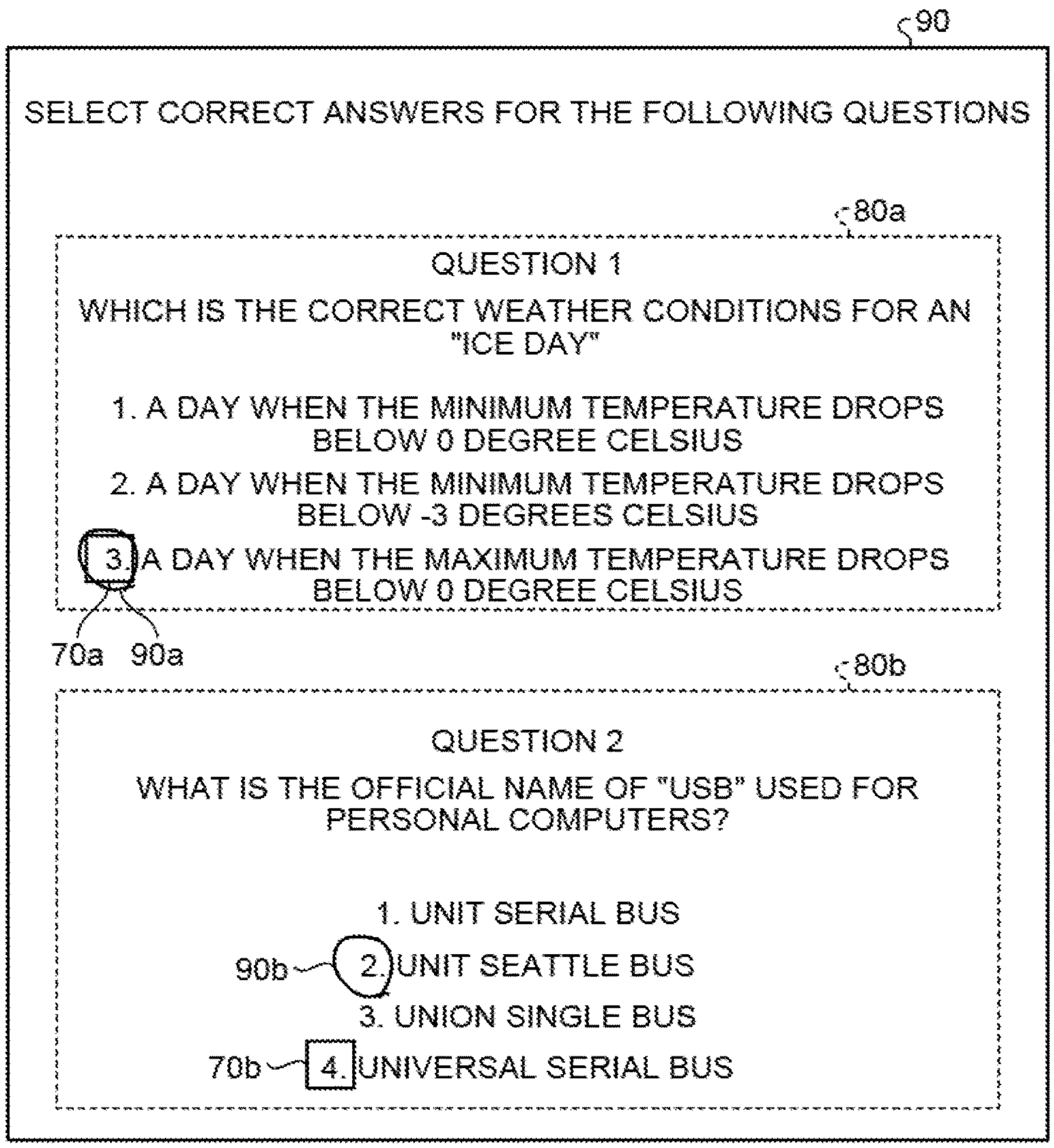

90
SELECT CORRECT ANSWERS FOR THE FOLLOWING QUESTIONS
80a
QUESTION 1
WHICH IS THE CORRECT WEATHER CONDITIONS FOR AN "ICE DAY"
1. A DAY WHEN THE MINIMUM TEMPERATURE DROPS BELOW 0 DEGREE CELSIUS
2. A DAY WHEN THE MINIMUM TEMPERATURE DROPS BELOW -3 DEGREES CELSIUS
3. A DAY WHEN THE MAXIMUM TEMPERATURE DROPS BELOW 0 DEGREE CELSIUS
70a
90a
80b
QUESTION 2
WHAT IS THE OFFICIAL NAME OF "USB" USED FOR PERSONAL COMPUTERS?
1. UNIT SERIAL BUS
90b
2. UNIT SEATTLE BUS
3. UNION SINGLE BUS
70b
4. UNIVERSAL SERIAL BUS

FIG.15

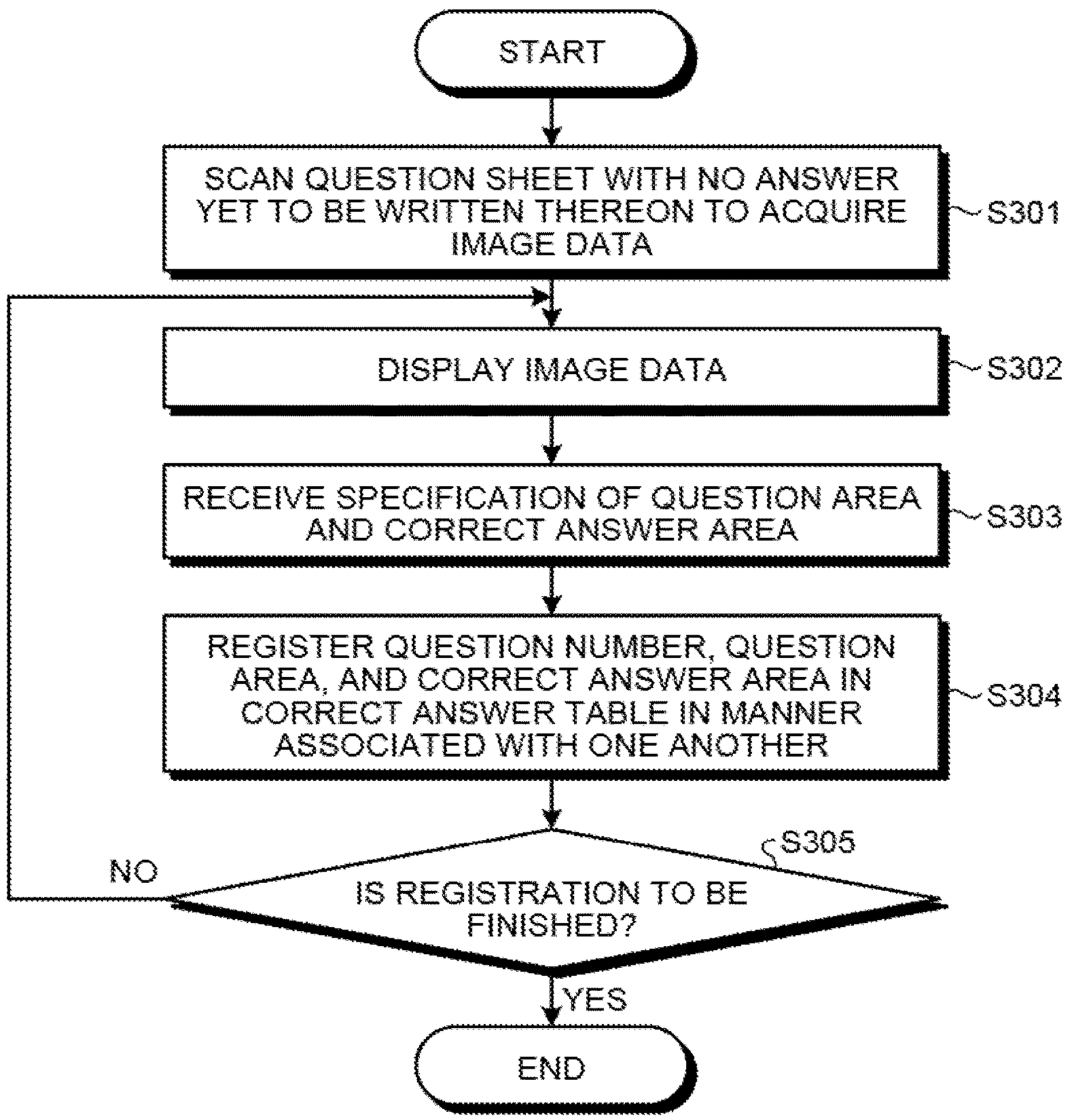

START
SCAN QUESTION SHEET WITH NO ANSWER YET TO BE WRITTEN THEREON TO ACQUIRE IMAGE DATA
S301
DISPLAY IMAGE DATA
S302
RECEIVE SPECIFICATION OF QUESTION AREA AND CORRECT ANSWER AREA
S303
REGISTER QUESTION NUMBER, QUESTION AREA, AND CORRECT ANSWER AREA IN CORRECT ANSWER TABLE IN MANNER ASSOCIATED WITH ONE ANOTHER
S304
S305
IS REGISTRATION TO BE FINISHED?
NO
YES
END

FIG.16

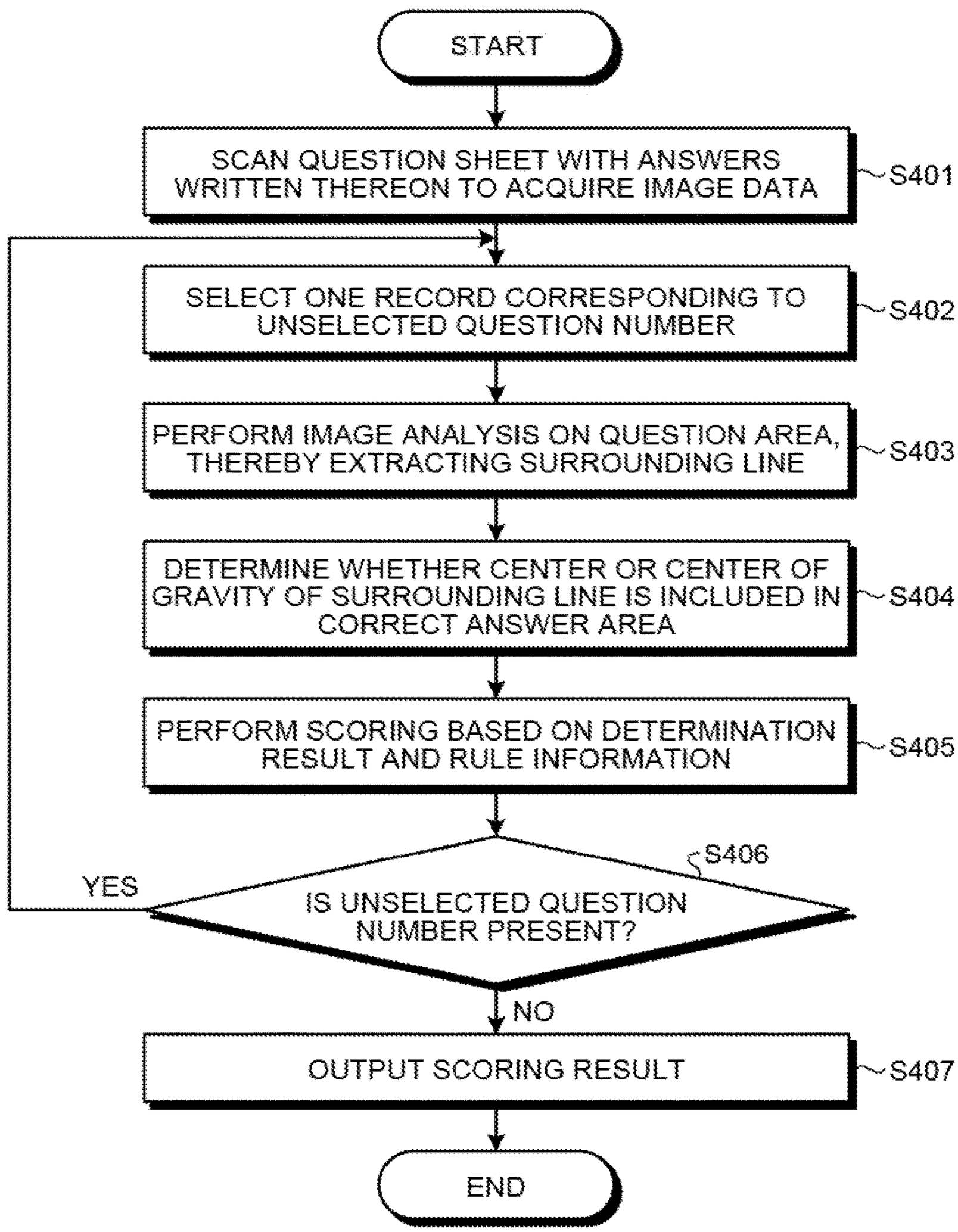
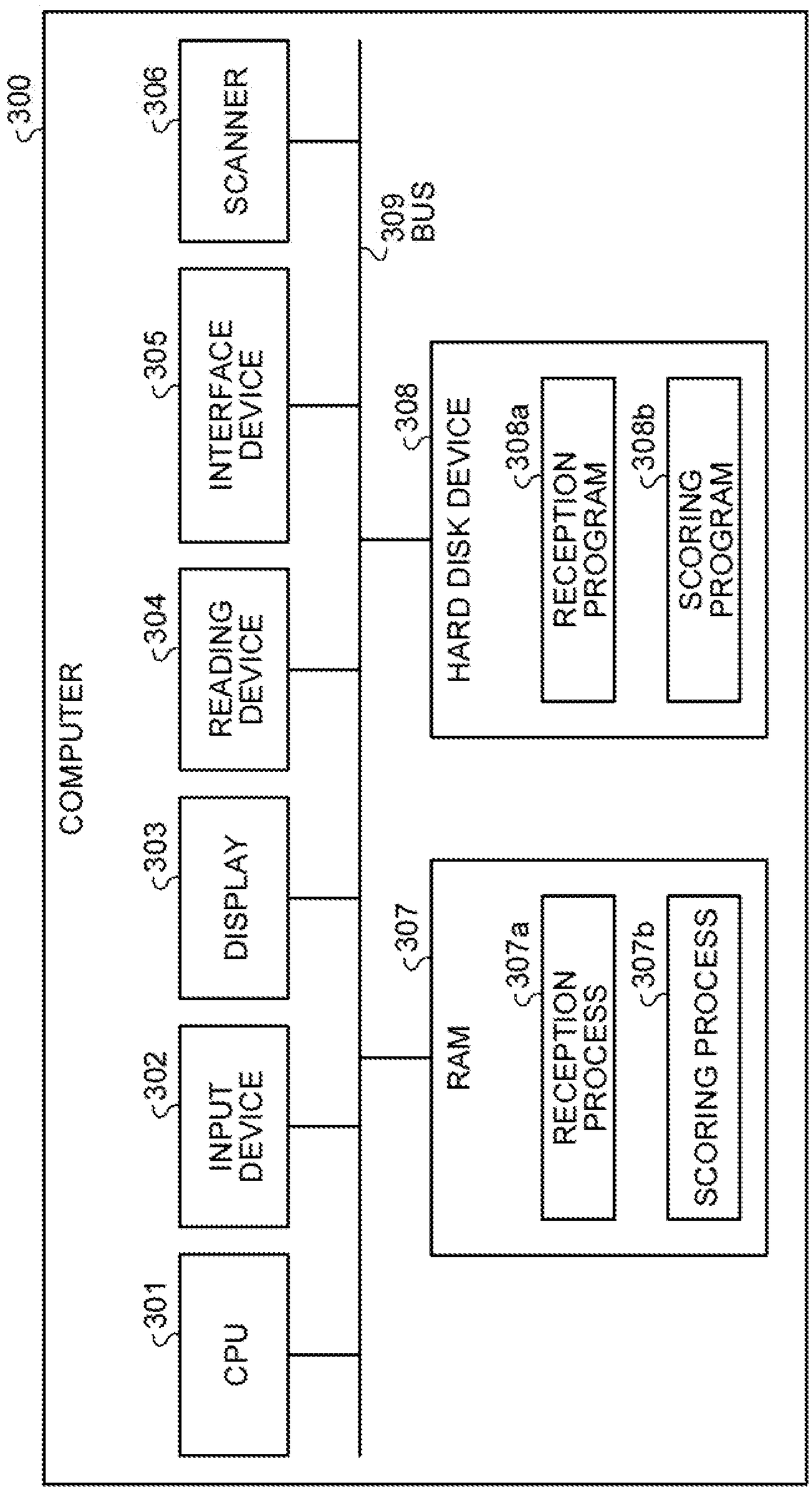

START
SCAN QUESTION SHEET WITH ANSWERS WRITTEN THEREON TO ACQUIRE IMAGE DATA
S401
SELECT ONE RECORD CORRESPONDING TO UNSELECTED QUESTION NUMBER
S402
PERFORM IMAGE ANALYSIS ON QUESTION AREA, THEREBY EXTRACTING SURROUNDING LINE
S403
DETERMINE WHETHER CENTER OR CENTER OF GRAVITY OF SURROUNDING LINE IS INCLUDED IN CORRECT ANSWER AREA
S404
PERFORM SCORING BASED ON DETERMINATION RESULT AND RULE INFORMATION
S405
S406
IS UNSELECTED QUESTION NUMBER PRESENT?
YES
NO
OUTPUT SCORING RESULT
S407
END

FIG.17


300
COMPUTER
301
CPU
302
INPUT DEVICE
303
DISPLAY
304
READING DEVICE
305
INTERFACE DEVICE
306
SCANNER
309
BUS
307
RAM
307a
RECEPTION PROCESS
307b
SCORING PROCESS
308
HARD DISK DEVICE
308a
RECEPTION PROGRAM
308b
SCORING PROGRAM

SCORING RULE APPLICATION TARGET SPECIFICATION METHOD, CORRECT/INCORRECT DETERMINATION RULE SETTING METHOD, APPLICATION TARGET SPECIFYING DEVICE, CORRECT/INCORRECT DETERMINATION RULE SETTING DEVICE, AND COMPUTER-READABLE RECORDING MEDIUM

CROSS-REFERENCE TO RELATED APPLICATION

This application is based upon and claims the benefit of priority of the prior Japanese Patent Application No. 2015-096503, filed on May 11, 2015, the entire contents of which are incorporated herein by reference.

FIELD

The embodiments discussed herein are related to a scoring rule application target specification method and the like.

BACKGROUND

In related scoring (for example, Japanese Laid-open Patent Publication No. 2010-101970, Japanese Laid-open Patent Publication No. 06-266278, Japanese Laid-open Patent Publication No. 03-164885, Japanese Laid-open Patent Publication No. 2007-48217), a teacher collects question sheets on which students write answers and checks whether the students write correct answers for respective questions on the question sheets, thereby performing scoring for each of the students. In this method, an increase in the number of students or the number of questions increases a burden on the teacher. To address this, technologies for automatic scoring has been developed. To enable a teacher to smoothly perform scoring work, for example, widely used are scoring systems that read marks using optical answer sheets or the like instead of print answer sheets.

The related technologies described above, however, fail to support creation of questions designed for electronic terminals from a print medium, scoring of the questions, and management of scores.

The scoring systems according to the related technologies using optical answer sheets fail to perform examination with a print medium used by a teacher or the like. Furthermore, the questions are limited to multiple-choice questions, whereby the scoring systems fail to perform examination that meets the teacher's demand. The use of the optical answer sheets, for example, leads students to certain answers to some extent, making it difficult to evaluate scholastic abilities of the students.

SUMMARY

According to an aspect of the embodiments, a non-tranistory computer-readable recording medium stores a scoring rule application target specification program that causes a computer to execute a process including: receiving specification of one or more areas in an image; and storing the one or more areas in a storage unit in a manner associated with a question number in order of being received.

The object and advantages of the invention will be realized and attained by means of the elements and combinations particularly pointed out in the claims.

It is to be understood that both the foregoing general description and the following detailed description are exemplary and explanatory and are not restrictive of the invention.

BRIEF DESCRIPTION OF DRAWINGS

FIG. **1** is a functional block diagram of a configuration of a scoring support device according to a first embodiment of the present invention;

FIG. **2** is an example diagram of a data structure of a correct answer table according to the first embodiment;

FIG. **3** is an example diagram of image data with no answer having been input thereto;

FIG. **4** is a diagram for explaining processing performed by a receiving unit according to the first embodiment;

FIG. **5** is an example diagram of image data with answers input thereto;

FIG. **6** is a diagram for explaining processing performed by a scoring unit according to the first embodiment;

FIG. **7** is a flowchart of a process of registration according to the first embodiment;

FIG. **8** is a flowchart of a process of scoring according to the first embodiment;

FIG. **9** is a functional block diagram of a configuration of the scoring support device according to a second embodiment of the present invention;

FIG. **10** is an example diagram of a data structure of the correct answer table according to the second embodiment;

FIG. **11** is an example diagram of image data with no answer for multiple-choice questions having been input thereto;

FIG. **12** is a diagram for explaining processing performed by the receiving unit according to the second embodiment;

FIG. **13** is an example diagram of image data with answers for the multiple-choice questions input thereto;

FIG. **14** is a diagram for explaining processing performed by the scoring unit according to the second embodiment;

FIG. **15** is a flowchart of a process of registration according to the second embodiment;

FIG. **16** is a flowchart of a process of scoring according to the second embodiment; and

FIG. **17** is an example diagram of a computer that executes an application target specification program or a correct/incorrect determination rule setting program.

DESCRIPTION OF EMBODIMENTS

Preferred embodiments will be explained with reference to accompanying drawings. The embodiments are not intended to limit the present invention.

[a] First Embodiment

FIG. **1** is a functional block diagram of a configuration of a scoring support device according to a first embodiment of the present invention. As illustrated in FIG. **1**, a scoring support device **100** includes a scanner **110**, an input unit **120**, a display unit **130**, a communication unit **140**, a storage unit **150**, and a control unit **160**. The scoring support device **100** is an example of the application target specifying device.

The scanner **110** is a device that reads a print medium on which questions are written, such as a question sheet, with an optical sensor or the like, thereby retrieving the surface of the print medium as image data. In the following descrip-

tion, image data retrieved from a print medium by the scanner **110** is appropriately simply referred to as image data.

The input unit **120** is an input device used by a user to input various types of information to the scoring support device **100**. The input unit **120** corresponds to a keyboard, a mouse, or a touch panel, for example.

The display unit **130** is a display device that displays information output from the control unit **160**. The display unit **130** corresponds to a display or a touch panel, for example.

The communication unit **140** is a communication device that performs data communications with am external device via a network. The control unit **160**, which will be described later, transmits and receives data to and from the external device via the communication unit **140**.

The storage unit **150** stores therein a correct answer table **151** and scoring rule information **152**. The storage unit **150**, for example, corresponds to a semiconductor memory device, such as a random access memory (RAM), a read only memory (ROM), and a flash memory, or a storage device, such as a hard disk drive (HDD).

FIG. **2** is an example diagram of a data structure in the correct answer table according to the first embodiment. As illustrated, in FIG. **2**, the correct answer table **151** stores therein a question number, a question area, answer areas, and correct answer contents in a manner associated with one another. The question number is information for uniquely identifying a question. The question area indicates an area on the image data in which a question corresponding to the question number is present. The question area is specified by coordinates of its upper left corner and coordinates of its lower right corner, for example.

The answer area indicates an area in which the user inputs an answer for the question corresponding to the question number. The answer area is specified by coordinates of its upper left corner and coordinates of its lover right corner, for example. The correct answer contents indicate contents of a correct answer corresponding to the answer area. The correct answer contents corresponding to an answer area "(x3,y3), (x4,y4)" are a "comma". If a ", (comma)" is input to the answer area "(x3,y3), (x4,y4)" of the electronic data, it is determined that the answer area receives a correct answer.

The scoring rule information **152** defines conditions on which an answer for a question is determined to be correct. The scoring rule information **152**, for example, includes the information that, if all answer areas corresponding to a question number receive the correct answer contents, and an area other than the answer areas receives no input, the answer for the question corresponding to the question number is determined to be correct. The scoring rule information **152** also defines a score given when the answer corresponding to the question number is correct.

The control unit **160** includes an image data acquiring unit **161**, a receiving unit **162**, and a scoring unit **163**. The control unit **160** corresponds to an integrated device, such as an application specific integrated circuit (ASIC) and a field programmable gate array (FPGA). The control unit **160**, for example, corresponds to an electronic circuit, such as a central processing unit (CPU) and a micro processing unit (MPU).

The image data acquiring unit **161** is a processing unit that acquires image data from the scanner **110**. The image data acquiring unit **161** outputs the image data to the receiving unit **162** or the scoring unit **163**. If the image data acquiring unit **161** acquires image data of a question sheet with no answer having been input thereto, for example, the image data acquiring unit **161** outputs it to the receiving unit **162**. If the image data acquiring unit **161** acquires image data of a question sheet with answers input thereto, the image data acquiring unit **161** outputs it to the scoring unit **163**. The image data acquiring unit **161** may be notified of whether the image data is data with no answer having been input thereto or data with answers input thereto by the user operating the input unit **120**.

The scoring support device **100** according to the first embodiment may read, with the scanner **110**, print media on which answers are writ Ion by students to perform scoring. Alternatively, the scoring support device **100** may display image data of a question sheet on terminal devices of the respective students and cause them to input the answers to perform scoring.

The receiving unit **162** is a processing unit that receives specification of one or more answer areas in the image data and registers the one or more answer areas in the correct answer table **151** in a manner associated with a question number in order of being received. The receiving unit **162** also receives correct answer contents corresponding to the respective answer areas and registers them in the correct answer table **151**. FIG. **3** is an example diagram of image data with no answer having been input thereto.

The following describes an example of processing performed by the receiving unit **162**. The receiving unit **162**, for example, displays image data **10** illustrated in FIG. **3** including a message such as that "specify the question area, the answer area, and the correct answer contents" on the display unit **130**. The receiving unit **162** may also display a "question area specification button", an "answer area specification button", a "correct answer content button", a "shift-to-next-question button", and an "end button", for example.

FIG. **4** is a diagram for explaining processing performed by the receiving unit according to the first embodiment. The user, such as a teacher, operates the input unit **120** to specify a question area **20***a* and press a question area specification button **1***a*, for example. The receiving unit **162** generates a unique question number and registers the coordinates of the question area **20***a* in the correct answer table **151** in a manner associated with the generated question number.

After pressing the question area specification button **1***a*, the user operates the input unit **120** to specify answer areas **10***a*, **10***b*, and **10***c* and press an answer area specification button **1***b*. The receiving unit **162** registers the coordinates of the answer areas **10***a* to **10***c* in the correct answer table **151** in a manner associated with the corresponding question number. Because the answer areas **10***a* to **10***c* are included in the question area **20***a*, for example, the receiving unit **162** registers the coordinates of the answer areas **10***a* to **10***c* in the correct answer table **151** in a manner associated with the question number of the question area **20***a*.

After pressing the answer area specification button **1***b*, the user operates the input unit **120** to input punctuation marks or the like serving as the correct answer contents to the answer areas **10***a* to **10***c* and presses a correct answer content button **1***c*. The receiving unit **162** performs a character analysis on the answer areas **10***a* to **10***c*, thereby identifying the correct answer contents. The receiving unit **162** then registers the answer areas and the correct answer contents in the correct answer table **151** in a manner associated with each other.

If a ", (comma)" is input to the answer area **10***a* as illustrated in FIG. **4**, for example, the receiving unit **162** registers the answer area **10***a* and the correct answer contents "coma" in the correct answer table **151** in a manner associated with each other. If a ", (comma)" is input to the

answer area **10***b*, the receiving unit **162** registers the answer area **10***b* and the correct answer contents "comma" in the correct answer table **151** in a manner associated with each other. If a ". (period)" is input to the answer area **10***c*, the receiving unit **162** registers the answer area **10***c* and the correct answer contents "period" in the correct answer table **151** in a manner associated with each other.

After completing specification of the question area, the answer areas, and the correct answer contents for a certain question, the user presses a shift-to-next-question button **1***d*. The user thus starts specification of a question area, answer areas, and correct answer contents for the next question.

Subsequently, the user specifies a question area **20***b* and presses the question area specification button **1***a*. The receiving unit **162** generates a unique question number and registers the coordinates of the question area **20***b* in the correct answer table **151** in a manner associated with the generated question number.

After pressing the question area specification button **1***a*, the user operates the input unit **120** to specify answer areas **11***a* and **11***b* and press the answer area specification button **1***b*. The receiving unit **162** registers the coordinates of the answer areas **11***a* and **11***b* in the correct answer table **151** in a manner associated with the corresponding question number. Because the answer areas **11***a* and **11***b* are included in the question area **20***b*, for example, the receiving unit **162** registers the coordinates of the answer areas **11***a* and **11***b* in the correct answer table **151** in a manner associated with the question number of the question area **20***b*.

After pressing the answer area specification button **1***b*, the user operates the input unit **120** to input punctuation marks or the like serving as the correct answer contents to the answer areas **11***a* and **11***b* and presses the correct answer content button **1***c*. The receiving unit **162** performs a character analysis on the answer areas **11***a* and **11***b*, thereby identifying the correct answer contents. The receiving unit **162** then registers the answer areas and the correct answer contents in the correct answer table **151** in a manner associated with each other.

After completing specification of the question area, the answer areas, and the correct answer contents for a certain question, the user presses the shift-to-next-question button **1***d*. The user thus starts specification of a question area, answer areas, and correct answer contents for the next question. By contrast, if the processing described above is completed for all the questions in the image data **10**, the user presses an end button **1***e*. When the end button **1***e* is pressed, the receiving unit **162** finishes the processing for registering information in the correct answer table **151**.

If the receiving unit **162** receives the rule information **152** via the input unit **120** or the communication unit **140**, the receiving unit **162** registers the received rule information **152** in the storage unit **150**. The user may operate the input unit **120**, thereby appropriately updating the rule information **152**.

Referring back to FIG. **1**, the scoring unit **163** is a processing unit that performs scoring based on the correct answer table **151** and the rule information **152** when receiving image data with answers input thereto. The scoring unit **163**, for example, selects a question number in the correct answer table **151** and specifies answer areas corresponding to the selected question number. If the answer areas in the question area corresponding to the question number receive correct answer contents, and an area other than the answer areas receives no input, the scoring unit **163** gives a score for the corresponding question based on the rule information **152**.

FIG. **5** is an example diagram of image data with answers input thereto. In the example illustrated in image data **50**, punctuation marks **50***a*, **50***b*, **50***c*, **50***d*, **50***e*, and **50***f* are input, for example. A student may input the punctuation marks **50***a* to **50***f* by writing them on a print medium and causing the scanner **110** to read them or by inputting them, with an input device, to a terminal device that displays the image data of the question sheet.

The processing performed by the scoring unit **163** will be described. FIG. **6** is a diagram for explaining the processing performed by the scoring unit according to the first embodiment. The following describes a case where the scoring unit **163** scores answers for a question of a question number "T101". Let us assume a case where the answer areas specified by the correct answer table **151** are the answer areas **10***a* to **10***c*. The scoring unit **163** compares the answer areas **10***a* to **10***c* with the image data **50**. The scoring unit **163** performs a character analysis on characters included in the answer areas **10***a* to **10***c* in the image data **50**, thereby identifying input characters (punctuation marks).

The scoring unit **163** determines whether the identified characters (punctuation marks) are identical with the respective correct answer contents corresponding to the answer areas **10***a* to **10***c* individually. Let us assume a case where the question number selected by the scoring unit **163** is "T101", for example, and the coordinates of the answer areas **10***a* to **10***c* are "(x3,y3), (x4,y4)", "(x5,y5), (x6,y6)", and "(x7,y7), (x8,y8)", respectively. Let us also assume a case where a ", (comma)" is input to the answer area **10***a* in the image data **50**, a ", (comma)" is input to the answer area **10***b*, and a ". (period)" is input to the answer area **10***c*. In this case, the correct answer contents of the respective answer areas in the correct answer table **151** are identical with the punctuation marks input to the respective answer areas **10***a* to **10***c* in FIG. **5**. The scoring unit **163** thus determines that the correct answer contents are input to the respective answer areas **10***a* to **10***c*.

After making a comparison of the answer areas **10***a* to **10***c*, the scoring unit **163** determines whether the other areas than the answer areas **10***a* to **10***c* in the question area **20***a* receive no input. The scoring unit **163**, for example, holds the image data **10** with no answer having been input thereto. The scoring unit **163** compares the image data **10** with the image data **50** with answers input thereto, thereby determining whether the other areas than the answer areas **10***a* to **10***c* in the question area **20***a* receive no input. In the example illustrated in FIG. **6**, the other areas than the answer areas **10***a* to **10***c* in the question area **20***a* receive no input.

The scoring unit **163** determines that the question area **20***a* corresponding to the question number satisfies the condition of the rule information **152** that the answer areas receive the respective correct answer contents and that the other areas than the answer areas receive no input. As a result, the scoring unit **163** gives a score for the question corresponding to the question number "T101". The score for the question corresponding to the question number has been registered in the rule information **152**, for example.

The following describes a case where the scoring unit **163** scores answers for a question of a question number "T102". Let us assume a case where the answer areas specified by the correct answer table **151** are the answer areas **11***a* and **11***b*. The scoring unit **163** compares the answer areas **11***a* and **11***b* with the image data **50**. The scoring unit **163** performs a character analysis on characters included in the answer areas **11***a* and **11***b* in the image data **50**, thereby identifying input characters (punctuation marks).

The scoring unit **163** determines whether the identified characters (punctuation marks) are identical with the respective correct answer contents corresponding to the answer areas **11***a* and **11***b* individually. Let us assume a case where the question number selected by the scoring unit **163** is "T102", for example, and the coordinates of the answer areas **11***a* and **11***b* are "(x9,y9), (x10,y10)" and "(x11, y11), (x12,y12)", respectively. Let us also assume a case where a ", (comma)" is input to the answer area **11***a* in the image data **50**, and a ". (period)" is input to the answer area **11***b*. In this case, the correct answer contents of the respective answer areas in the correct answer table **151** are identical with the punctuation marks input to the respective answer areas **11***a* and **11***b* in FIG. **5**. The scoring unit **163** thus determines that the correct answer contents are input to the respective answer areas **11***a* and **11***b*.

After making a comparison of the answer areas **11***a* and **11***b*, the scoring unit **163** determines whether the other areas than the answer areas **11***a* and **11***b* in the question area **20***b* receive no input. The scoring unit **163**, for example, holds the image data **10** with no answer having been input thereto. The scoring unit **163** compares the image data **10** with the image data **50** with answers input thereto, thereby determining whether the other areas than the answer areas **11***a* and **11***b* in the question area **20***b* receive no input. In the example illustrated in FIG. **6**, an area other than the answer areas **11***a* and **11***b* in the question area **20***b* receives input of the punctuation mark **50***f*.

The scoring unit **163** determines that the question area **20***b* corresponding to the question number does not satisfy the condition of the rule information **152** that the answer areas receive the respective correct answer contents and that the other areas than the answer areas receive no input. As a result, the scoring unit **163** does not give a score for the question corresponding to the question number "T102".

The scoring unit **163** performs the processing described above on the questions, thereby determining whether to give scores for the respective questions. The scoring unit **163** adds up the given scores, thereby calculating a score for the image data **50**. The scoring unit **163** may display the calculated score on the display unit **130** or notify an external device of the score via the communication unit.

In a case where an answer area receives no input or where an input character is not identical with the correct answer contents, which is not illustrated in FIG. **6**, the scoring unit **163** determines that the condition of the rule information **152** is not satisfied. Also in this case, the scoring unit **163** does not give a score for the question.

The following describes a process of registration for scanning a question sheet with no answer having been written thereon and registering various types of information in the correct answer table **151** performed by the scoring support device **100** according to the first embodiment. FIG. **7** is a flowchart of the process of registration according to the first embodiment. As illustrated in FIG. **7**, the image data acquiring unit **161** of the scoring support device **100** scans a question sheet with no answer having been written thereon to acquire image data (Step S**101**).

The receiving unit **162** of the scoring support device **100** displays the image data on the display unit **130** (Step S**102**). The receiving unit **162** receives specification of a question area and answer areas (Step S**103**) and receives punctuation marks of correct answers for the respective answer areas (Step S**104**).

If input of the answer areas and the correct answer contents for one question is not completed yet (No at Step S**105**), the receiving unit **162** performs the processing at Step S**103** again. By contrast, if input of the answer areas and the correct answer contents for one question is completed (Yes at Step S**105**), the receiving unit **162** performs processing at Step S**106**.

The receiving unit **162** registers a question number, the question area, the answer areas, and the correct answer contents in the correct answer table **151** in a manner associated with one another (Step S**106**). If the registration is not to be finished (No at Step S**107**), the receiving unit **162** performs the processing at Step S**102** again. By contrast, if the registration is to be finished (Yes at Step S**107**), the receiving unit **162** finishes the processing.

The following describes a process of scoring for scanning and scoring a question sheet with answers written thereon performed by the scoring support device **100** according to the first embodiment. FIG. **8** is a flowchart of a process of scoring according to the first embodiment. As illustrated in FIG. **8**, the image data acquiring unit **161** of the scoring support device **100** scans a question sheet with answers written thereon to acquire image data with the answers written thereon (Step S**201**). The scoring support device **100** may display image data with no answer written thereon on the display unit **130** to receive input of answers to the displayed image data.

The scoring unit **163** of the scoring support device **100** refers to the correct answer table **151** to select one record corresponding to an unselected question number (Step S**202**). The scoring unit **163** performs a character analysis on the answer areas, thereby determining whether punctuation marks are present (Step S**203**). The scoring unit **163** performs a character analysis on the other areas than the answer areas in the question area, thereby determining whether punctuation marks are present (Step S**204**).

The scoring unit **163** performs scoring based on the result of determination at Steps S**203** and S**204** and the rule information **152** (Step S**205**). If the question area satisfies the condition of the rule information **152** that all the answer areas receive the respective correct answer contents and that the other areas than the answer areas receive no input at Step S**205**, for example, the scoring unit **163** gives a score.

If an unselected question number is present (Yes at Step S**206**), the scoring unit **163** performs the processing at Step S**202** again. By contrast, if no unselected question number is present (No at Step S**206**), the scoring unit **163** outputs a scoring result (Step S**207**).

The following describes advantages effects of the scoring support device **100** according to the first embodiment. The scoring support device **100** receives specification of one or more answer areas in image data and registers the one or more answer areas in the correct answer table **151** in a manner associated with a question number in order of being received. By using the information registered in the correct answer table **151**, for example, the scoring support device **100** can score the image data with answers input thereto. With this configuration, the scoring support device **100** can support creation of questions designed for electronic terminals from a print medium used by a teacher or the like, scoring of answers of students for the questions, and management of scores.

The scoring support device **100** registers, in the correct answer table **151**, the contents of input to the specified one or more answer areas or the contents of input corresponding to display of a certain question number of the one or more areas as a correct answer for the certain question number. With this configuration, the scoring support device **100** can determine whether answers input to the respective answer areas are correct, thereby performing scoring.

When receiving specification of the answer areas in the image data and specification of input of a plurality of correct answers, the scoring support device **100** stores the answer areas in the correct answer table **151** as an application target of the scoring rule that a score corresponding to the answer areas is given when all the specified input of correct answers is received and when no other input than the input of correct answers is received. With this configuration, if all the answer areas receive input of correct answers, but an area other than the answer areas receives input of a punctuation mark, the scoring support device **100** can determine that the answers are incorrect as a whole.

The scoring support device **100** uses scanned image data, thereby facilitating its creation of questions designed for electronic terminals from a print medium used by a teacher or the like.

[b] Second Embodiment

FIG. **9** is a functional block diagram of a configuration of a scoring support device according to a second embodiment of the present invention. As illustrated in FIG. **9**, a scoring support device **200** includes a scanner **210**, an input unit **220**, a display unit **230**, a communication unit **240**, a storage unit **250**, and a control unit **260**. The scoring support device **200** is an example of the correct/incorrect determination rule setting device.

Description of the scanner **210**, the input unit **220**, the display unit **230**, and the communication unit **240** illustrated in FIG. **9** is the same as that of the scanner **110**, the input unit **120**, the display unit **130**, and the communication unit **140** illustrated in FIG. **1**.

The storage unit **250** stores therein a correct answer table **251** and scoring rule information **252**. The storage unit **250**, for example, corresponds to a semiconductor memory device, such as a RAM, a ROM, and a flash memory, or a storage device, such as an HDD.

FIG. **10** is an example diagram of a data structure of the correct answer table according to the second embodiment. As illustrated in FIG. **10**, the correct answer table **251** stores therein a question number, a question area, and a correct answer area in a manner associated with one another. The question number is information for uniquely identifying a question. The question area indicates an area on image data in which a question corresponding to the question number is present. The question area is specified by coordinates of its upper left corner and coordinates of its lower right corner, for example.

The correct answer area indicates an area in which a line surrounding a correct answer is written in a multiple-choice question including a correct answer and incorrect answers. The correct answer area is specified by coordinates of its upper left corner and coordinates of its lower right corner, for example.

The scoring rule information **252** defines conditions on which an answer for a question is determined to be correct. The scoring rule information **252**, for example, includes the information that, if the center or the center of gravity of the surrounding line input by the user is included in the correct answer area, the answer for the question corresponding to the question number is determined to be correct. The scoring rule information **252** also includes the information that, if the center or the center of gravity of the surrounding line input by the user in the question area is not included in the correct answer area, the answer for the question corresponding to the question number is determined to be incorrect.

The control unit **260** includes an image data acquiring unit **261**, a receiving unit **262**, and a scoring unit **263**. The control unit **260** corresponds to an integrated device, such as an ASIC and an FPGA. The control unit **260**, for example, corresponds to an electronic circuit, such as a CPU and an MPU.

The image data acquiring unit **261** is a processing unit that acquires image data from the scanner **210**. The image data acquiring unit **261** outputs the image data to the receiving unit **262** or the scoring unit **263**. If the image data acquiring unit **261** acquires image data of a question sheet with no answer having been input thereto, for example, the image data acquiring unit **261** outputs it to the receiving unit **262**. If the image data acquiring unit **261** acquires image data of a question sheet with answers input thereto, the image data acquiring unit **261** outputs it to the scoring unit **263**. The image data acquiring unit **261** may be notified of whether the image data is data with no answer having been input thereto or data with answers input thereto by the user operating the input unit **220**.

The scoring support device **200** according to the second embodiment may read, with the scanner **210**, print media on which answers are written by students to perform scoring. Alternatively, the scoring support device **200** may display image data of a question sheet on terminal devices of the respective students and cause them to input the answers to perform scoring.

The receiving unit **262** is a processing unit that receives and registers information on the question area and the correct answer area of each question in the correct answer table **251**. When receiving the rule information **252**, the receiving unit **262** registers the rule information **252** in the storage unit **250**. FIG. **11** is an example diagram of image data with no answer for multiple-choice questions having been input thereto.

The following describes an example of processing performed by the receiving unit **262**. The receiving unit **262**, for example, displays image data **60** illustrated in FIG. **11** including a message such as that "specify the question area and the correct answer area" on the display unit **230**. The receiving unit **262** may also display a "question area specification button", a "correct answer area specification button", a "shift-to-next-question button", and an "end button", for example.

FIG. **12** is a diagram for explaining processing performed by the receiving unit according to the second embodiment. The user, such as a teacher, operates the input unit **220** to specify a question area **80***a* and press a question area specification button **2***a*, for example. The receiving unit **262** generates a unique question number and registers the coordinates of the question area **80***a* in the correct answer table **251** in a manner associated with the generated question number.

After pressing the question area specification button **2***a*, the user operates the input unit **220** to specify a correct answer area **70***a* and press a correct answer area specification button **2***b*. The receiving unit **262** registers the coordinates of the correct answer area **70***a* in the correct answer table **251** in a manner associated with the corresponding question number.

After completing specification of the question area and the correct answer area for a certain question, the user presses a shift-to-next-question button **2***c*. The user thus starts specification of a question area and a correct answer area for the next question.

Subsequently, the user specifies a question area **80***b* and presses the question area specification button **2***a*. The receiv-

ing unit **262** generates a unique question number and registers the coordinates of the question area **80***b* in the correct answer table **251** in a manner associated with the generated question number.

After pressing the question area specification button **2***a*, the user operates the input unit **220** to specify a correct answer area **70***b* and press the correct answer area specification button **2***b*. The receiving unit **262** registers the coordinates of the correct answer area **70***b* in the correct answer table **251** in a manner associated with the corresponding question number.

After completing specification of the question area and the correct answer area for a certain question, the user presses the shift-to-next-question button **2***c*. The user thus starts specification of a question area and a correct answer area for the next question. By contrast, if the processing described above is completed for all the questions in the image data **60**, the user presses an end button **2***d*. When the end button **2***d* is pressed, the receiving unit **262** finishes the processing for registering information in the correct answer table **251**.

Referring back to FIG. **9**, the scoring unit **263** is a processing unit that performs scoring based on the correct answer table **251** and the rule information **252** when receiving image data with answers input thereto. The scoring unit **263**, for example, selects a question number in the correct answer table **251** and specifies a correct answer area corresponding to the selected question number. If the center or the center of gravity of the surrounding line input as an answer is positioned in the correct answer area, the scoring unit **263** gives a score for the corresponding question based on the rule information **252**. By contrast, if the center or the center of gravity of the surrounding line input as an answer is not positioned in the correct answer area, the scoring unit **263** does not give the score for the corresponding question based on the rule information **252**.

FIG. **13** is an example diagram of image data with answers for the multiple-choice questions input thereto. In the example illustrated in image data **90**, surrounding lines **90***a* and **90***b* are input, for example. A student may input the surrounding lines by writing them on a print medium and causing the scanner **210** to read them or by inputting them, with the input device, to the terminal device that displays the image data of the question sheet.

The processing performed by the scoring unit **263** will be described. FIG. **14** is a diagram for explaining processing performed by the scoring unit according to the second embodiment. The following describes a case where the scoring unit **263** scores a question in the question area **80***a* of a question number "T201" in the correct answer table **251**. The scoring unit **263**, for example, compares the image data **60** with no answer having been input thereto with the image data **90** with answers input thereto. The scoring unit **263** thus extracts a surrounding line **90***a* included in the question area **80***a*.

The scoring unit **263** determines whether the center or the center of gravity of the surrounding line **90***a* is positioned in the correct answer area **70***a*. Because the center or the center of gravity of the surrounding line **90***a* in the example illustrated in FIG. **14** is positioned in the correct answer area **70***a*, the scoring unit **263** determines that the surrounding line **90***a* satisfies the condition of the rule information **252**. In this case, the scoring unit **263** gives a score for the question corresponding to the question number "T201". The score for the question corresponding to the question number has been registered in the rule information **252**, for example.

The following describes a case where the scoring unit **263** scores an answer for a question in the question area **80***b* of a question number "T202". The scoring unit **263**, for example, compares the image data **60** with no answer having been input thereto with the image data **90** with answers input thereto. The scoring unit **263** thus extracts a surrounding line **90***b* included in the question area **80***b*.

The scoring unit **263** determines whether the center or the center of gravity of the surrounding line **90***b* is positioned in the correct answer area **70***b*. Because the center or the center of gravity of the surrounding line **90***b* in the example illustrated in FIG. **14** is not positioned in the correct answer area **70***b*, the scoring unit **263** determines that the surrounding line **90***b* does not satisfy the condition of the rule information **252**. In this case, the scoring unit **263** does not give a score for the question corresponding to the question number "T202".

The scoring unit **263** performs the processing described above on the questions, thereby determining whether to give scores for the respective questions. The scoring unit **263** adds up the given scores, thereby calculating a score for the image data **90**. The scoring unit **263** may display the calculated score on the display unit **230** or notify an external device of the score via the communication unit.

In a case where no surrounding line is input to the question area or where a plurality of surrounding lines are present even though a single item is supposed to be selected, which is not illustrated in FIG. **14**, the scoring unit **263** does not give the score for the question.

The following describes a process of registration for scanning a question sheet with no answer having been written thereon and registering various types of information in the correct answer table **251** performed by the scoring support device **200** according to the second embodiment. FIG. **15** is a flowchart of a process of registration according to the second embodiment. As illustrated in FIG. **15**, the image data acquiring unit **261** of the scoring support device **200** scans a question sheet with no answer having been written thereon to acquire image data (Step S**301**).

The receiving unit **262** of the scouring support device **200** displays the image data on the display unit **230** (Step S**302**). The receiving unit **262** receives specification of a question area and a correct answer area (Step S**303**). The receiving unit **262** registers a question number, the question area, and the correct answer area in the correct answer table **251** in a manner associated with one another (Step S**304**).

If the registration is not to be finished (No at Step S**305**), the receiving unit **262** performs the processing at Step S**302** again. By contrast, if the registration is to be finished (Yes at Step S**305**), the receiving unit **262** finishes the processing.

The following describes a process of scoring for scanning and scoring a question sheet with answers written thereon performed by the scoring support device **200** according to the second embodiment. FIG. **16** is a flowchart of a process of scoring according to the second embodiment. As illustrated in FIG. **16**, the image data acquiring unit **261** of the scoring support device **200** scans a question sheet with answers written thereon to acquire image data with the answers input thereto (Step S**401**). The scoring support device **200** may display image data with no answer written thereon on the display unit **230** to receive input of answers to the displayed image data.

The scoring unit **263** of the scoring support device **200** refers to the correct answer table **251** to select one record corresponding to an unselected question number (Step S**402**). The scoring unit **263** performs an image analysis on the question area, thereby extracting a surrounding line

(Step S**403**). The scoring unit **263** determines whether the center or the center of gravity of the surrounding line is included in the correct answer area (Step S**404**).

The scoring unit **263** performs scoring based on the determination result and the rule information **252** (Step S**405**). If the center or the center of gravity of the input surrounding line is positioned in the correct answer area, for example, the scoring unit **263** gives a score for the question.

If an unselected question number is present (Yes at Step S**406**), the scoring unit **263** performs the processing at Step S**402** again. By contrast, if no unselected question number is present (No at Step S**406**), the scoring unit **263** outputs a scoring result (Step S**407**).

The following describes advantages effects of the scoring support device **200** according to the second embodiment. When receiving specification of a correct answer area corresponding to a correct answer while displaying a question sentence instructing students to draw a line surrounding the correct answer, the scoring support device **200** stores, in the storage unit **250**, the rule information that the answer for the question sentence is determined to be correct if the center or the center of gravity of the input surrounding line is positioned in the correct answer area. By using the rule information, for example, the scoring support device **200** can score the image data with answers input thereto. With this configuration, the scoring support device **200** can support creation of questions designed for electronic: terminals from a print medium used by a teacher or the like, scoring of answers of students for the questions, and management of scores.

The following describes an example of a computer that executes an application target specification program or a correct/incorrect determination rule setting program that provides functions similar to those of the scoring support devices **100** and **200** according to the embodiments above. FIG. **17** is an example diagram of a computer that executes the application target specification program or the correct/incorrect determination rule setting program.

As illustrated in FIG. **17**, a computer **300** includes a CPU **301**, an input device **302**, and a display **303**. The CPU **301** performs various types of arithmetic processing. The input device **302** receives input of data from the user. The computer **300** also includes a reading device **304**, an interface device **305**, and a scanner **306**. The reading device **304** reads a computer program or the like from a storage medium. The interface device **305** transmits and receives data to and from another computer via a network. The computer **300** also includes a RAM **307** and a hard disk device **308**. The RAM **307** temporarily stores therein various types of information. The devices **301** to **308** are connected to a bus **309**.

The hard disk device **308** reads and loads a reception program **308***a* and a scoring program **308***b* to the RAM **307**. The reception program **308***a* functions as a reception process **307***a*. The scoring program **308***b* functions as a scoring process **307***b*. The reception process **307***a*, for example, corresponds to the receiving units **162** and **262**. The scoring process **307***b* corresponds to the scoring units **163** and **263**.

The reception program **308***a* and the scoring program **308***b* are not always stored in the hard disk device **308** in advance. The programs, for example, may be stored in a "portable physical medium", such as a flexible disk (FD), a compact disc read only memory (CD-ROM), a digital versatile disc (DVD), a magneto-optical disc, and an integrated circuit (IC) card, inserted into the computer **300**. In this case, the computer **300** reads and executes the reception program **308***a* and the scoring program **308***b* from the medium.

The present invention can support creation of questions designed for electronic terminals from those on a print medium, scoring of answers of students, and management of scores.

All examples and conditional language provided herein are intended for pedagogical purposes of aiding the reader in understanding the invention and the concepts contributed by the inventors to further the art, and are not to be construed as limitations to such specifically recited examples and conditions, nor does the organization of such examples in the specification relate to a showing of the superiority and inferiority of the invention. Although one or more embodiments of the present invention have been described in detail, it should be understood that the various changes, substitutions, and alterations could be made hereto without departing from the spirit and scope of the invention.

What is claimed is:

1. A non-transitory computer-readable recording medium storing a scoring rule application target specification program that causes a computer to execute a process comprising:

first receiving a first image from a scanner which retrieves a surface of a print medium with no answer;

second receiving specification of one or more first answer areas to input a period and a comma in the first image;

third receiving specification of one or more first question areas in the first image;

specifying coordinates of the first question areas;

specifying one or more second answer areas included in a second question area wherein the first answer areas include the second answer areas and the first question areas include the second question area;

fourth receiving the period and the comma corresponding to the second answer areas respectively, from an input device;

storing question numbers, the second question area, the second answer areas and the period and the comma in an answer table respectively;

fifth receiving a second image from the scanner which retrieves a surface of a second print medium having a period and a comma;

identifying the period and the comma included in areas corresponding to the second answer areas in the second image; and

determining whether the period or the comma in the second image are corresponding to the period or the comma in the answer table respectively.

2. The non-transitory computer-readable recording medium according to claim **1**, wherein the storing stores contents of input to the specified one or more second answer areas or contents of input corresponding to display of a certain question number of the one or more second answer areas as the answer contents.

3. The non-transitory computer-readable recording medium according to claim **1**, wherein the storing stores, in the answer table, when receiving specification of a specific area in the first image and specification of input of a plurality of correct answers, the specific area as an application target of a scoring rule that a score corresponding to the specific area is given when all the specified input of correct answers is received and when no other input than the input of correct answers is received.

4. A scoring rule application target specification method comprising:

first receiving a first image from a scanner which retrieves a surface of a print medium with no answer, by a processor;

second receiving specification of one or more first answer areas to input a period and a comma in the first image, by the processor;

third receiving specification of one or more first question areas in the first image, by the processor;

specifying coordinates of the first question areas, by the processor;

specifying one or more second answer areas included in a second question area wherein the first answer areas include the second answer areas and the first question areas include the second question area, by the processor;

fourth receiving the period and the comma corresponding to the second answer areas respectively, from an input device, by the processor;

storing question numbers, the second question area, the second answer areas and the period and the comma in an answer table respectively, by the processor;

fifth receiving a second image from the scanner which retrieves a surface of a second print medium having a period and a comma, by the processor;

identifying the period and the comma included in areas corresponding to the second answer areas in the second image, by the processor; and

determining whether the period or the comma in the second image are corresponding to the period or the comma in the answer table respectively, by the processor.

5. The scoring rule application target specification method according to claim **4**, wherein the storing stores contents of input to the specified one or more second answer areas or contents of input corresponding to display of a certain question number of the one or more second answer areas as the answer contents, by the processor.

6. The scoring rule application target specification method according to claim **4**, wherein the storing stores in the answer table, when receiving specification of a specific area in the first image and specification of input of a plurality of correct answers, the specific area as an application target of a scoring rule that a score corresponding to the specific area is given when all the specified input of correct answers is received and when no other input than the input of correct answers is received, by the processor.

7. An application target specifying device comprising:

a processor that executes a process including:

first receiving a first image from a scanner which retrieves a surface of a print medium with no answer;

second receiving specification of one or more first answer areas to input a period and a comma in the first image;

third receiving specification of one or more second first question areas in the specified one or more first areas in the first image;

specifying coordinates of the first question areas;

specifying one or more second answer areas included in a second question area wherein the first answer areas include the second answer areas and the first question areas include the second question area;

fourth receiving answer contents the period and the comma corresponding to the specified one or more second answer areas respectively, from an input device;

storing question numbers, the specified one or more first second question area, the specified second answer areas and the answer contents period and the comma in an answer table respectively;

fifth receiving a second image from the scanner which retrieves a surface of a second print medium having answer a period and a comma;

identifying input characters the period and the comma included in areas correspond to the second answer areas in the second image; and

determining whether the period or the comma in the second image are corresponding to the period or the comma in the answer table respectively.

8. The application target specifying device according to claim **7**, wherein the storing stores contents of input to the specified one or more second answer areas or contents of input corresponding to display of a certain question number of the one or more second answer areas as the answer contents.

9. The application target specifying device according to claim **7**, wherein the storing stores, in the answer table, when receiving specification of a specific area in the first image and specification of input of a plurality of correct answers, the specific area as an application target of a scoring rule that a score corresponding to the specific area is given when all the specified input of correct answers is received and when no other input than the input of correct answers is received.

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